Electronic Research Notebook Demonstration Workshop

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About this Event

This workshop will provide case-studies of different tools in use by researchers working across various fields.

Summary of main user requirements and problems identified

The main user requirements for an electronic research notebook identified during this workshop were:

1. It should allow the principal investigator (PI) of a project to be able to have ownership and oversight of the whole team's work
2. It should not allow work to be deleted. The PI should always be able to access all work from their team, even if a member of the team has left
3. It should have privacy settings which can be adjusted to allow different levels of sharing
4. It should allow signatures and witness signatures to be added (essential if work will later be patented)
5. It should allow data to be exported in different formats
6. It should allow researchers to work with very large data files
7. It should be interoperable with data repositories and other research information systems
8. It should automatically save
9. Researchers working in the life sciences would like a way to easily link to samples and resources

The main problems with implementing an electronic research notebook identified during this workshop were:

1. It is difficult to choose an electronic research notebook which will work across all disciplinary areas. Many electronic research notebooks cater for the life sciences which can be off-putting for other researchers, especially those in humanities and social sciences (HSS). Different disciplinary cultures mean that the requirements listed

above would not necessarily be relevant for researchers in HSS (for example, the need for a PI to see everyone's work, the need for witness signatures)

2. However, using a more generic solution such as OneNote may mean that the user requirements listed above are not able to be met (eg. signatures, deletion, exporting to PDF). This would cause a major problem for researchers in some areas
3. If an electronic research notebook seems too complicated, attendees felt that users would be put off. Some felt it was a good idea to be able to remove or hide modules that were not relevant
4. It is hard to embed usage of electronic research notebooks into researchers' workflows, especially if they have never used one before. Attendees felt that was important to get top down buy-in to encourage use. It is possible that funder pressure may help with this, but limitations were noted with how researchers comply with existing funder mandates to deposit their data
5. Cost

Notes on demos and general discussion

LabCollector

LabCollector was chosen as suitable for communication between a large group of PhD students

Not just an electronic research notebook, but also an inventory with modules for samples etc.

Features

- Virtual freezer resembling the freezer (of samples) kept in lab (Inventory)
- Constant oversight by supervisors of their students' work
- Template for protocols and options for sharing protocols
- Workflow templates, useful for if you repeat the same steps in experiments
- You can record experiments, use tags to search and link sample data
- Nothing can be deleted, and there is good versioning so you can't lose data.
- Once you close an experiment you add electronic signature and supervisor checks it, after that you can't add to or modify the experiment.

Questions

Q: How much time does it takes to develop templates and workflows?
A: Very quick if you use premade templates, otherwise similar to typing on MS Word

Comment (from speaker): It takes time to get used to/familiarise yourself with the system but very useful in academia & industry once familiarised.

Discussion of cost (no specific details given)

Q: Is there is a need for a tool that can be used for different disciplines? Many tools appear to be just created for the Life Sciences
A (from audience): The tool may be relevant for sociologists/ethnographers who need to keep track of different types of data types, but how is it different from tools already available such as NVivo?

Comment: Very good for big groups of researchers/PhD students

Comment: In the lab itself people still use paper as they can't take their own devices in, but can print out from LabCollector. Many labs now have dedicated lab tablets.

Q: Are there privacy settings allowing different levels of sharing?
A: Yes

Discussion about the amount of supervisory oversight enabled by LabCollector and how this varies between disciplinary cultures even within STEM areas. Pros and cons of this discussed; some might consider it too much (and may make more work for the supervisor) but benefits for openness and cases where research integrity is questioned.

Labstep

Started by researchers at Oxford frustrated by tools available.

Free for academia, but costs for biotech companies. Unlimited storage space.

Browser based therefore needs an internet connection to work

Set up to record "Projects" and "Experiments" but it could be used to record any unit of work - could it be applied to other disciplines?

Tags used for filtering

'Live experiment' shows experiments that haven't been finished, allows you to jump between them

Optimised for mobile or tablet - good for lab dedicated tablets

Features

- Timers
- Ability to add protocols, resources, results, notes etc.
- “Folder watcher” - on your desktop, you can drop files in and it automatically uploads them to Labstep
- R and Python package so data analysis can be part of your workflow
- Version controlled
- Ability to keep inventory of resources - can upload from excel file
- Can make protocols public with wider community (each one has stable link)
- Open API to allow modifications
- Live chat for support - requesting features & asking for help
- Trialling ‘Ask a question’ feature, building network of people where you can ask for help on experiments/protocol (comment: confusing whether this feature is for help with the system or help with the work)

Questions

Q: Can data be exported?
A: You can export data but not all the data for a whole project (solutions for this being worked on now)

Comment: Seems a ‘friendly’ system - easy to use

Comment: Issue with switching to electronic research notebooks: people not using them. In this case, it is useful for the PI to be able to see everyone’s work so they can nudge them to fill it in

Comment (from speaker): Labstep aims to offer a choice, you can work individually or more openly.

Comment (from speaker): Labstep offers the flexibility to make preliminary notes, upload a quick data file and continue the work tomorrow

Q: Can items be deleted?
A: There is an area for ‘Deleted items’ as users wanted somewhere to put files they weren’t using any more, but it is restorable by the owner. Complies with need to keep an audit trail.

Q: Is there capacity for very large data files
A: File size limit 100mb upload but negotiable & working on solutions (eg. DAT)

Q: for researchers working with animals; is there an easy way to link animal, organ, sample etc.
A: there is a way to do this but perhaps not very intuitive - they are working on solutions for this.

Q: When a user leaves a project, what happens to the content?
A: Content stays in the project even if a user leaves, although user still has the ability to remove the project. Concern that it would be important to not let user delete files. Many attendees felt that it was important that the PI was owner of the project, rather than the individual researcher.

Comment re. storage: users can store files in the tool itself or can connect to other storage (although the details of this would have to be discussed with company)

Q: Is Labstep interoperable with repositories & CRIS & could you automate it so it backed up to a repository every 2 years.
A: Yes, but may require custom work

Q: Can we add digital signatures and witness signature needed for patents.
A: No witness signatures at the moment but it could be modified to add this feature

RSpace

Choice between RSpace Enterprise or RSpace community (free) community.researchspace.com

Features

- Workspace - size of screen adjustable, works on mobile devices and desktop computers
- Work arranged in linear/chronological order (mimicking a paper research notebook) Folders arranged hierarchically
- Free text box, with ability to add different elements (images etc.)
- Gallery: different file types can be stored on the RSpace server
- Nothing can be deleted.
- Internal message system
- Interacts with different systems (dropbox, slack, figshare, institutional repositories, protocols.io)
- PI automatically gets top down view of everything that happens in the lab
- Ability to export content in different formats
- Can make profile linked to ORCiD
- Unique identifiers allow you to cite specific documents and easily share
- Imports MS word files (eg protocols), images etc.

- Pull in content from third party sources (eg. PubMed)
- Plugins allow you to work with specialist file types
- Specialist search functions (chemical search etc.)
- Form builder tool
- Open API
- Autosaves
- Calendar files help RSpace link to lab task management/shared calendars

Questions

Q: Can we clarify how things are deleted? Can the PI see deleted item?
Files could be deleted permanently with the help of system administrators but this is not made obvious to all users. Searchable Lists of deleted items can be seen by individual and system administrator (not PI?)

Q: Is there an autosave function?
Yes, autosaving occurs all the time

Q: Can the PI hand over work to someone else when someone leaves?
A: Yes, when someone leaves their login becomes inactive but PI still has access to data. Several ways to do this, including exporting files and reimporting them.

Q: What is eCAT?
A: It is an inventory system made by the same company as RSpace. Can be used together, but some research teams who use RSpace have a separate inventory system

Q: Are there data limits?
A: No limits imposed by RSpace but may be by hosting server

- We then watched videos on Hivebench (Elsevier) and Comnote (designed for the use by musicians/music researchers)

Final questions and comments

Difficulty in encouraging the uptake of these systems when institutions adopt them.

Interest in looking at OneNote as a generic solution.

Comment: RSpace may work better than the others demoed today across disciplines because the inventory tool can be linked/unlinked and there it uses more neutral language (eg. not “experiments”)

Important to convince senior management to buy in. Funder pressure may be influential here (although there are limitations on how researchers comply with funder mandates to deposit data)

Electronic research notebooks could be a way to encourage researchers to think about their data earlier in the research process

Audience member has trialled several electronic research notebooks but can't find the balance between simplicity of OneNote and complexity of LabCollector. Also very expensive for charity funded teams.

At the moment, one attendee is encouraging the use of MS Word as a simple solution, one step above paper notebook as can be uploaded onto Sharepoint.

Audience comment: there are some needs that are absolutely essential; signatures for patents, backup, need to be able to integrate the methodology with the data, need to access data after people had left

If too complicated users are put off - good idea to be able to remove or hide modules depending on what is relevant to them

Notes: Emily Nunn 05/04/2019